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The Report on the Iron Industry

The report by the Joint Iron Council forms the second portion of the White Paper on " Iron and Steel," the first section being the report from the British Iron and Steel Federation. Of shorter length, the latter discloses a well-considered plan for the modernisation of the steel industry through the expenditure of £168,000,000. Virtually no reference is made to the steelfoundry industry, except to state " that expansions to meet war demands have been so great that the major problems to be faced are not problems of rebuilding or extension of capacity." The " Iron Industry Report " is divided into two sections—Part I deals with foundry pig-iron production—except hematite—and its major recommendation, the installation of more up-to-date blast furnace plant in Scotland.

Part II is very long, running to over 50 pages. There are 1,750 ironfoundries in the country, now employing 98,000 people, and making about 2½ million tons of castings. Almost three-quarters of this production was made in 350 concerns. To attain the proposed target of 3½ million, the labour force will have to be increased to 140,000. An estimate is given of the requirements needed for this production, which *inter alia* includes a quarter of a million tons of coke. At £3 a ton the fuel bill for the industry will, in the near future, be of the order of £7½ million per annum. The authors of the report believe that about 5 per cent. of this amount could be saved by the full application of available technical knowledge. It is the intention of the C.F.A. energetically to pursue this question of fuel economy as further savings are obviously possible. On labour, there is a wealth of evidence to support the statement that the output per man hour has in recent years decreased—a feature not peculiar to ironfounding. The report does not stress in its generalisations, but some sections have emphasised the fact that the personnel is now five years older, and, little fresh blood has been introduced to give the extra energy needed. The return of well-fed ex-servicemen may supply this, as has been the trend in the mines. Some space is devoted to recruitment, and following the lead the JOURNAL has given, it is stressed that blackness is not synonymous with intensity in so far as dirt is concerned. The plans and achievements of the C.F.A. are disclosed for tackling the problem of recruitment and amenities. Finally, there is a note to the effect that the industry is spending several million pounds on schemes of modernisation.

The report next proceeds to consider (alphabetically) the industry in seven sections. This is by no means a complete list, as shipbuilding, chilled roll and textile engineering foundries do not receive separate treatment, yet what has been done is, to our mind, representative of the whole industry. The motor-vehicle and high-duty alloy section of the industry is now making castings to the annual value of £5,830,415, a figure capable of being raised to £8 million if a full labour force were available. The position and prospects of the foundries making builders' castings follow. From a pre-war production value of the order of £10 million, there has been a decrease to about £6 million, and with a full labour force this could be raised to £22 million. These production figures are to be associated with a labour force of 19,500, 12,000 and 25,000. For the first time there is disclosed the pre-war agreement with Gussemaile-Syndikat, which regulated the participation of the British and German bath manufacturers in the home and certain overseas markets. This was necessary, as in 1934, no less than 25 per cent. of the total consumption was of German origin. Later it was reduced to 13.25 per cent. A review of the export markets is included,

(*Continued overleaf.*)

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and therein is given in detail the troubles encountered in selling goods abroad. Currency manipulation, chicanery, harnessing of standards to impose commercial difficulties, and politics all have their place in one or other of the world's markets. It is desirable that this knowledge should be broadcast to the operatives in industry.

The next section of the report is from the **Flushing Cistern Makers' Association.** In 1938, 8,668 tons of cisterns were made to the value of £157,107. The next five years should see this augmented to 10,000 tons. Because of the favourable report on competition, which is stated to be non-existent in both the home and export market, except Argentina, and in the future, South Africa, Egypt, and India, it appears to us that special attention should be given in order to strengthen the hold indicated by every means possible, for no reliance can be placed on the continuation of existing conditions. The fifth section is from the **Cast Iron Heating Boiler and Radiator Manufacturers' Association.** Herein five concerns make 90 per cent. of the output. In 1938, 73,000 tons valued at £1½ million were made. Today, granted an adequate labour force, the production could be stepped up to 79,000 tons to the value of £2½ million. The potential demand is of the order of 100,000 tons. This could be effected by introducing night shifts. Though this section is highly mechanised, it is proposed to spend a further £720.000 on further improvements. The export position is deemed to be favourable.

The manufacturers of cast-iron pipe, in their report, have reviewed recent history, with the object of teaching the man-in-the-street that it is the British who have pioneered modern manufacturing methods. The size of this section can be gathered from the fact that in 1938, 514.523 tons valued at £4½ million were turned out. At the moment the demand is reduced to 265.000 tons. of which 85.000 are for export. The future should see this rise to 700,000 tons per annum. The export position is that though between the two wars 25 per cent. of the production was sent overseas, the picture is obscure, due to high tariffs. Under the omnibus heading "Engineering and Jobbing," there are reports from both the **Ironfounders' National Confederation** and the **National Ironfounding Employers' Federation.** Combining the two reports, we find that in 1938, 637,000 tons were made (value £13,000,000). The estimated demand is of the order of 710,000 tons, which could easily be achieved with the present production capacity given an adequate labour force. This section of the industry is to spend about £2,000,000 on modernisation. The production of ingot moulds has during the last eight years fluctuated between 250,000 and 300,000 tons. The **National Ingot Mould Association** are being embarrassed in their efforts to mechanise by the old-fashioned attitude adopted by labour organisations in certain districts.

Few sections can make a wider variety of castings than the **National Association of Malleable Ironfounders.** In 1938, 52,764 tons valued at £2½ million were manufactured. Today, with adequate labour, the industry could make 73,000 tons valued at £5.8 million. An important section—treated separately—is the making of malleable tube fittings. In this connection the **British Malleable Tube Fittings Association** report a production in 1939 of 8,670 tons valued at just over a million pounds. There is ample reserve capacity in this highly mechanised section. Despite this an expenditure of £500,000 is envisaged.

Under the heading Railway Equipment, three associations report. The first is by the **Cast Iron Axle Box Association.** It appears that during 1945, 7,800 tons were made, but this can be stepped up to 20,000. The **Cast Iron Chair Association** state that their output in 1938 was of the order of 100,000 tons, valued at £826,470. The existing capacity is 186,000 tons. The Association ask for a more enlightened buying policy from the railway companies to aid planning. Finally, the **Cast Iron Segment Association** in their report bring home to overseas readers the effects of total mobilisation, as since the outbreak of war the production of this class has been exactly nil. Yet this section in 1938 turned out 67,800 tons of castings to a value of £600,000. The report concludes with a few observations by the Joint Iron Council and statements of the activities of the British Cast Iron Research Association and the Institute of British Foundrymen.

There has been some complaint in editorial circles that no statistical summary was given. We personally are pleased at the omission for in truth it would only have meant, figuratively, the addition of apples, oranges and bananas and calling the aggregate "fruit." As the report stands it brings home to the reader the real complexity of the industry—a factor not quite appreciated by the politicians with whom we have spoken. There is to be found amongst this aggregation of reports certain outstanding features which can be set out in the following terms:—

(*Continued on page* 54.)

CLOSER CO-OPERATION BETWEEN THE FOUNDRY AND PATTERN SHOP*

Part Two

By H. S. W. BRITTAIN

(*Discussion continued from p. 4.*)

It is the Author's opinion that Mr. Meredith does not claim to have had no co-operation from the pattern shop or that other foundries have lacked this quality of combination between the two departments, but what he is attempting to bring about is a still closer combination of the two departments. This can be achieved by each department stating its difficulties and attempting to obviate them in future. It is obvious to every foundryman and pattern-maker that full co-operation must be achieved to enable the foundry industry to change over to peace production and enter the competitive market.

The term " co-ordination " is preferable, since if anything is lacking it is the co-ordination of every detail which goes into the manufacture of a casting. Generally one finds that in most foundries the four main types of moulding are used. That is green-sand, dry-sand, loam and machine. The specialised types such as centrifugal, etc., are not taken as within the scope of this Paper. In these four types of moulding, numerous kinds of iron, steel or non-ferrous metals are cast.

It is a well-known fact that each type of moulding needs special knowledge and is a trade in its single application. Every type of metal cast, reacts differently under each one of these moulding methods, and a whole mass of information is necessary to carry out the processes involved, so that good castings can be produced. Imagine the position of any pattern shop attached to a foundry using all methods of moulding and a numerous variation of types of metals. Then consider the huge number of different design of castings required by the customers, and the fact that each one demands a different technique in moulding. It is no small wonder that the pattern shop cannot hope to carry out correctly the production of patterns and moulding equipment in all cases without the very closest co-ordination.

The foundry has on its staff specialists who devote their whole time to the behaviour of cast metals, and foundry materials, and pass this information on to the foundry industry. In the same way the Author suggests it is necessary for internal organisation to pass on to the pattern shop as much information as possible regarding the methods of moulding individual castings, and their behaviour when cast. The present position seems to be to expect the pattern-maker to know all that is necessary, simply by handing over the blue-print drawing and requesting a pattern. This, of course, cannot be so, and is not even desirable; from somewhere must come a large amount of information. This will be returned to later.

There is little doubt that in a good many instances pattern shops do not get all they could desire. By and large it is suggested that even now the foundry is well catered for in the production of pattern equipment, particularly so where information is lacking of

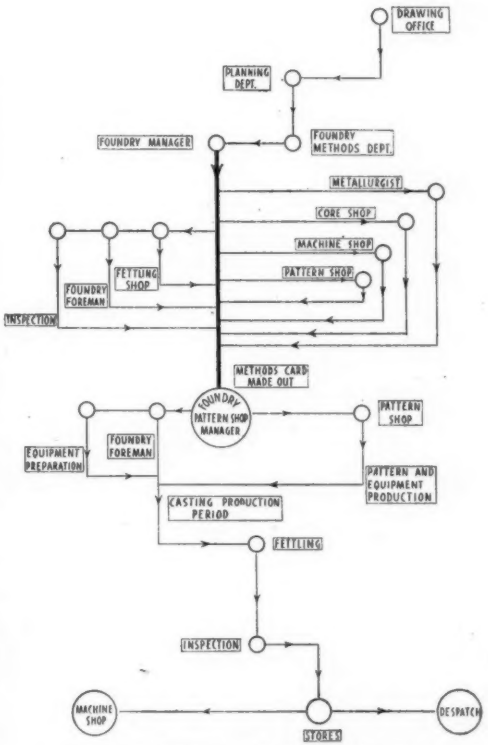

FIG. 1.—CASTINGS PRODUCTION CHART.

*Paper contributed to a discussion on " Closer Co-operation between the Foundry and Pattern Shop," before the Sheffield branch of the Institute of British Foundrymen on January 7, 1946.

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foundry requirements. It is not unusual to find that when a pattern is almost made, or even delivered, to the foundry and in the course of making the mould, someone will discover that they could have made it some other way or that it is not suitable in certain detail, or that there is not equipment to mould it in and various other defects that are laid at the doors of the pattern-maker. These difficulties cause the moulder to denounce the pattern shop generally when in fact it is very often the fault of the foundry.

Reading Drawings

Most foundry executives can read a drawing sufficiently to imagine the outline shape of the required casting, but cannot go into sufficient detail to be able to say direct from the drawing just how it must be arranged for moulding or where cores or loose pieces, etc., are necessary. This is probably most evident where a foundry is engaged on jobbing work and only a few castings are required off each pattern.

TABLE I.—*Chart of Information to Pattern Shop.*

1	Type of moulding. Green sand, Dry sand, etc.	
2	Method of moulding.	
3	Type of pattern Wood, Metal, Stone compound, etc.	
4	,, core Oil sand, Dry ,, Green sand or by blower	
5	,, core-print.	
6	,, core box Turn over plate or rammed on plate, etc.	
7	Core made in halves or whole.	
8	Any special contraction.	
9	Kind of metal.	
10	Special m/c. allowances.	
11	Camber—Amount and direction.	
12	Shape and size of runners and position.	
13	,, ,, heads ,, ,,	
14	,, ,, ingates and downgates.	
15	Chills, position and shape.	
16	If moulding box pattern required.	
17	No. of patterns per box.	
18	Size of box part.	
19	Shape of box part. (Drg. if special)	
20	If ramming or turn over board required.	
21	Type of core irons.	
22	Which m/c. if m/c. moulded.	
23	Group making casting.	
24	Foundry planned period.	

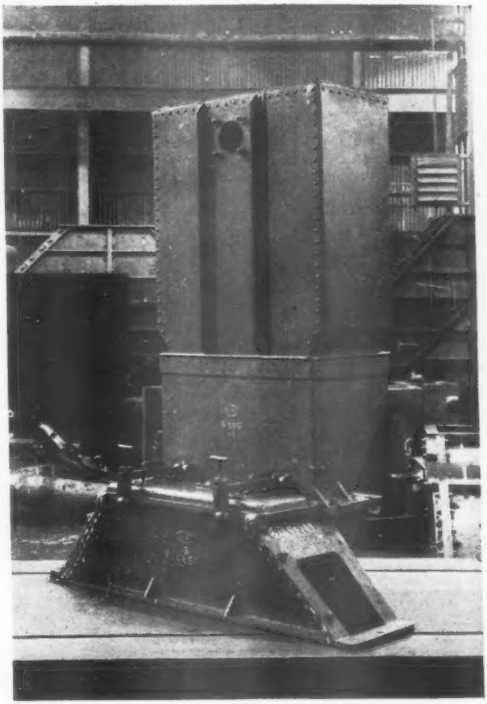

FIG. 2.—FRONT VIEW OF AUXILIARY HOPPER.

Training

A broader view is necessary in the training of apprentice pattern-makers. Generally they lack foundry knowledge which can easily be given to them. The wise employer will arrange that the apprentice is given a period of at least one year in the foundry on all types of moulding, and it might even be an advantage to include some metallurgy and sand-testing. This training could be spread over a period of say four years. Pattern-makers would then be trained with a foundry sense of their own, not one engendered by the pattern shop foreman. No apprentice would object to working in the dirty sand if he knew that it would enable him to be a more useful pattern-maker. He may even find it fascinating to produce castings.

Management

A point of much speculation is on pattern shop management. There are two schools of thought on the matter and are often in conflict. Some pattern shops are entirely separate from the foundry; in others

FIG. 3.—BACK VIEW OF AUXILIARY HOPPER.

the pattern shop is under the managership of the foundry manager. When the pattern shop is governed by the foundry staff, it is reasonable to assume that a closer co-operation is possible between the two departments than where they are divided. Where the combination of the two departments is in operation, at least a good start is possible in the co-ordination of effort. Where the pattern shop is under separate management it becomes a question of who should collect and co-ordinate all the information to enable the correct equipment for moulding to be made. Usually the foreman pattern-maker will use his own ideas and then find all the difficulties before mentioned. When this occurs, a serious problem arises (for the foundries), since they either carry on under difficulties, or send the pattern back for alteration to suit their own ideas. In any case someone gets annoyed, and delays are inevitable, whereas had procedure been possible starting from foundry most difficulties would have been appreciated and a better understanding between the two departments would have been achieved.

Procedure

It is imperative that in the case of every new job, pattern-making should not start until the methods to be employed in making the casting have been discussed and settled. Sometimes, due to established practice, certain types of castings are basically alike; in these cases pattern-making can be started pending the settlement of minor details. As an illustration of the routine that could be followed in the manufacture of a casting, the Author has drawn up a chart to avoid a lengthy explanation.

Table I illustrates the information that should be collected and passed on to the pattern shop at the earliest possible moment, preferably before any work is commenced in the pattern shop. Since each particular job varies, every detail may not apply, but by and large one can say that seldom does the pattern shop get the information shown here at the right time. All this may seem like spoon-feeding the pattern shop, but if it gives the foundry what it needs in the way of pattern equipment, then no harm is done by feeding.

"Imported" Patterns

Where patterns are sent from one firm's pattern shop to another firm's foundry, these are usually termed "imported" patterns. It is not unusual in these instances for the foundry producing the castings to send these to their own pattern shop for modification, extra patterns, or to be prepared for machine moulding; then the pattern shop has its own grumble because it is called upon to alter other people's work. It is certain that unless the foundry producing the castings gives precise details to the outside pattern-makers, this difficulty will never be overcome.

A few more of the pattern-maker's complaints are of a general character, such as:—(1) Seeing his pattern damaged by foundry rapping; (2) the pattern being rapped in other places than where he has put rapping plates and blocks; (3) the pattern being returned for new loose pieces to be fitted due to loss in the foundry; (4) core boxes damaged and requiring renewing; (5) foundry sand adhering to a pattern that is returned for storage, repair, or revarnishing; and (6) when a pattern makes two or more castings by some form of alteration, it is most annoying when it is necessary to carry out the entire alterations again because it is found out very late that the original casting is a waster.

Referring again to Fig. 1, this outlines the stages through which the production of a casting passes. Its chief object is to suggest the introduction of an internal organisation known as "The Methods Department"

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to contact the various departments here mentioned and correlate the information on to what is known as a "methods" card. This can be very simple or elaborate as the particular job demands. Having collected and arranged the information, to see that it is passed on to the pattern shop, and carried out as laid down.

Figs. 3, 4, 5 and 6 show front and back views of auxiliary hoppers, the complete hoppers being built up of a series of various shaped castings. Each casting is made by the green-sand method of moulding, and demands a special technique in its manufacture, since no machining is done on them, and when assembled they must fit to a tolerance of $\frac{1}{8}$ in. in depth, width and length. A further feature is to show that where the plates joint together no moulding taper can be allowed, and the use of cores is no sure cure, particularly in a jobbing foundry.

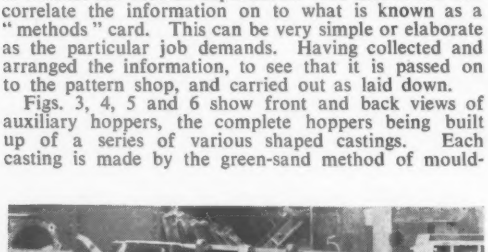


FIG. 4.—FRONT VIEW OF AUXILIARY HOPPER.

All bolt holes are cored, and are subject to close limits. It is only by rigid co-operation of every department concerned in the manufacture and assembly of these castings that reasonable success can be, and is, achieved.

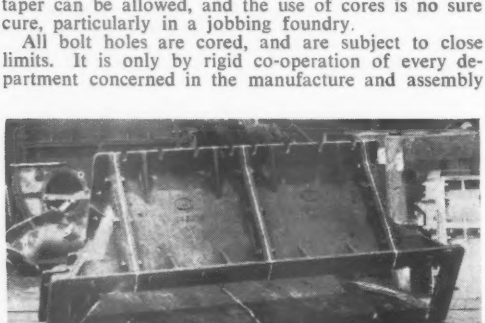


FIG. 5.—BACK VIEW OF AUXILIARY HOPPER.

FIG. 6.—FRONT VIEW OF EXTRACTOR.

Figs. 7 and 8 show two views of an extractor box. In this case the end-plates are machine moulded, whilst the side-plates are made by the hand method of green-sand moulding, as in the previous hopper castings. The tolerance allowed is the same as above, and great care is necessary to ensure the castings fitting together correctly. There are many features in these castings which will be apparent to pattern-maker and foundryman alike.

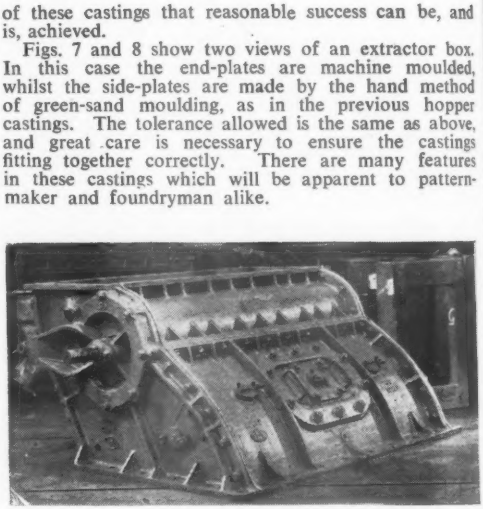


FIG. 7.—BACK VIEW OF EXTRACTOR.

Conclusion

In conclusion the Author believes that now is the time to discover how best we can co-operate to make British foundries the best possible, and only by having an efficient organisation can one hope to achieve this aim. It is quite evident that the pattern shop will become more and more the hub of the foundry, to supply the highest quality equipment for ease of foundry production.

The Author's thanks are due to Newton Chambers & Company, Limited, Thorncliffe Ironworks, for allowing him to deliver this part of the lecture and for the use of the illustrations and information.

LONDON BRANCH ANNUAL MEETING

The annual general meeting of the London branch of the Institute of British Foundrymen was held at Charing Cross Hotel, London, W.C.2, on April 30, the branch president (Mr. A. J. Murphy, M.Sc.) in the chair.

The minutes of the preceding annual meeting having been taken as read, were confirmed and signed. The hon. secretary (Mr. F. Arnold Wilson), moving the adoption of the accounts for the year 1945, said they were noteworthy in that the subscriptions remitted to Head Office amounted to £871, which was a record; it compared with the figure of £775 in the previous year. On the other hand, expenses due to increased membership were naturally higher, being £161, against £141 for the previous year. The motion for the adoption of the accounts was seconded by Mr. G. C. Pierce (branch past-president) and was carried unanimously, the branch president commenting that the accounts could not be more satisfactory.

In presenting his first report as honorary secretary, Mr. Wilson, *inter alia*, said that he primarily wished to express his grateful thanks to all the office-bearers of the branch, including particularly Mr. V. C. Faulkner, his predecessor as secretary, who had been always available for advice, the members of the branch council, and in particular the members of the branch who had been without exception so understanding and helpful. Rationing difficulties had precluded a quick return to social functions, but a beginning had been made with the annual dinner in December, whilst three works visits had been arranged.

Technical Visits

The session opened with 100 members on a visit to the Charlton works of J. Stone & Company, Limited, followed by tea, and the presidential address which consisted of a not-for-publication account of conditions in Germany as he had personally found them. The October meeting was a joint one with the Institute of Metals, when Mr. Clifford Shaw gave a fascinating Paper on "The Application of Ethyl Silicate to Foundry Practice"—Mr. Noel Shaw's demonstration afterwards was most effective. At the November meeting, Mr. C. H. Kain dealt very ably with the intricacies of Professor Shestopal's Paper on the "Technological Principles of Casting Design." On December 7 there was the annual dinner at Pimm's Red House in Bishopsgate when 80 sat down, a fact auguring well for future similar functions. At the January meeting a well-known patent agent expounded patent laws as affecting the metallurgical industry, in a way which all could understand and profit by. There was also a very successful works visit in January to Ealing Park Foundry, Limited—so successful in fact that Mr. R. B. Templeton had most kindly invited the branch again in June so that those whose applications were refused owing to restriction of numbers in January would now be able to take part. The February meeting had an Eastern setting, namely, Mr. J. Blakiston's Paper on "Opportunity for the Foundry Technician in India," and Mr. Blakiston impressed his audience with his deep knowledge not only of foundry practice, but also his vivid awareness of the psychology of the Indian people. The March meeting was Dr. Ingall's address on "The Education and Recruitment of Foundrymen"—a subject of immense importance and which produced probably the best discussion of the whole session. There is to be a works visit this month to Lake & Elliot, Limited, by the kind invitation of Mr. C. H. Kain and his co-directors.

Membership.—At the last annual general meeting, this had reached a record total of 525—to-day it is no less than 32 more—making 557.

Sections.—Both the East Anglian section and the Slough section have had most successful sessions with excellent attendances at their meetings and works visits.

Education.—The sub-Committee has been extremely active and a class of 26 young foundrymen started at Borough Polytechnic in November last. The sub-Committee is examining the possibilities of extending education in other centres in the Metropolitan area.

In conclusion Mr. Wilson recorded his warm appreciation of the services being rendered to the Institute by the two section secretaries, Mr. Sumner and Mr. Pike, and to Mr. Ellis who has operated the lantern so efficiently.

Election of Officers

The following office-bearers were elected for the ensuing session:—

As branch president, MR. G. R. WEBSTER; as senior vice-president, MR. E. M. CURRIE; as junior vice-president, MR. P. D. PINCOTT; as hon. secretary, MR. F. ARNOLD WILSON; as auditors, MR. V. DELPORT and MR. C. CLEAVER; as members of council, MR. F. W. ROUSHAM, MR. F. OLDERSHAW and MR. C. A. FARLANTI; as branch delegates to the General Council, MR. C. H. KAIN, MR. E. M. CURRIE, MR. F. H. HOULT, MR. A. C. TURNER and MR. V. DELPORT; as branch representative on the Technical Council, MR. A. LOGAN.

The branch president took the opportunity to pay tribute to the work of Mr. F. J. Wares on the Council over a period of 20 years. It was a fine example, he said, of inconspicuous service faithfully given. When the Council had learned that it was Mr. Wares' firm intention to retire they had felt it appropriate to record in the minutes their appreciation of his long service to the Council. (Applause.)

Meetings for Next Session

Following a request by some of the members living on the south coast that consideration should be given to holding branch meetings, or some of them, on Saturdays, the members of the branch as a whole were circularised and were asked to express their preferences.

On the basis of the replies received, the Council had decided that meetings should still be held on Wednesdays at 7.30 p.m., as at present; but, in view of the fact that there was a strong vote, though not a majority vote, for Saturday meetings, meetings would be held occasionally on Saturdays. It was hoped that that decision would meet with the approval of the members.

(*Continued on next page, col.* 2.)

NOTES FROM THE BRANCHES

WEST RIDING OF YORKSHIRE.—The annual general meeting was held at the Technical College, Bradford, on April 27. The hon. secretary (Mr. George Pollard) indicated in his report, a satisfactory and interesting year under the presidency of Mr. J. Timbrell; 30 new members had joined the branch, which now has 236 members; excellent attendances at the meetings were recorded, and several works' visits were carried out during last summer. The retiring officers were collectively thanked, and, at Mr. Forrest's request, this was carried with acclamation.

Mr. Thornton and Mr. Worcester gave an interesting account of their attendances at the General Council meetings, and were unanimously asked to continue as delegates for the branch. Mr. Forrest gave an account of the S. W. Wise Memorial Fund, and at this juncture Mr. Timbrell presented the divided prize money awarded to Mr. Stott and Mr. Padley, for their respective papers, presented at the College some weeks ago. Mr. Timbrell also invited a much better response to the entries for this competition. Mr. G. W. Nicholls reported on the Technical Council's activities comprehensively and was asked to continue as the branch representative, to which he agreed.

The following office bearers for the next session were elected:—As president, Mr. H. Balme; as senior vice-pesident, Mr. D. W. Hammond; as junior vice-president, Mr. H. Squires; as hon. secretary, Mr. George Pollard.

Discussion on the coming syllabus was carried on for a while, and the general meeting was brought to a close, in order to run through a film of the branch visit to the Renishaw Iron Company, Limited, last summer. This record of the visit provided happy recollections to all who went on this instructive trip, where Capt. Stanier and his staff ably explained the various processes and complexities associated with blast furnaces and the technical control.

WALES AND MONMOUTH.—The annual meeting was held at the Engineers' Institute, Cardiff, on April 27. Mr. E. J. Kelly in his opening remarks thanked the branch council and the members generally for supporting him in carrying out his duties as branch president during his term of office. The attendance at meetings had been very satisfactory, and the interest shown by members, most encouraging. The thanks of the branch were due to firms which had so generously invited them to visit their works during the session, at the same time affording facilities to hold lectures, and providing refreshments. He looked forward to an increase in membership, particularly in West Wales, where it was intended to open a section at an early date.

Having approved the statement of accounts, the election of officers was proceeded with as follows:—

As branch president, Mr. E. J. Kelly (for a second year); as senior vice-president, Mr. W. H. Thomas, Merthyr; as junior vice-president, Prof. W. R. D. Jones, Cardiff; as hon. secretary and treasurer, Mr. A. S. Wall; as branch auditors, Mr. W. S. Kinsman and Mr. R. G. Williams; as National Council delegates, Mr. C. A.

(*Continued at foot of next column.*)

THE REPORT ON THE IRON INDUSTRY

(*Continued from p.* 48.)

(1) There is a very grave shortage of labour.

(2) The intake of labour is inadequate.

(3) The extensive co-operation within the industry is extremely helpful to every section, by bringing into the limelight problems affecting every unit and by taking action for their national solution.

(4) Wide interest is taken in research and technology.

(5) The degree of mechanisation is greater than is generally realised.

(6) Future planning is largely dependent on the policy and progress made by the consumer-industries, *e.g.*, cast iron segments or railway chairs, etc.

(7) Elasticity in output must be preserved. Generally speaking, the foundry industry is the servant of all other industries and trades. Like all other good servants, it receives its orders and then plans the best way of carrying out the work involved. If a servant knows that carpet-sweeping is a routine job she rightly demands mechanised help. Thus, as more and more articles become standardised there will be an equivalent mechanised production forthcoming. These, however, are not invariably questions for the servant but for the master. If the report has done nothing else, it has for the first time in history, given a reasonably complete statistical picture of the ironfounding industry.

LONDON BRANCH ANNUAL MEETING

(*Continued from previous page.*)

Ten short Papers, all dealing with the subject of patterns, were submitted for competition. They were all read by Dr. Everest, and their order of merit was decided by the votes of the members present.

Prizes were awarded as follows:—

First prize of £2 2s., offered by the branch president, won by Mr. A. M. Whipp.

Three other Papers gained the same amount of votes, and the authors received prizes offered by Mr. V. C. Faulkner, Mr. F. Arnold Wilson and Mr. G. R. Webster. The prize-winners were Mr. Gordon S. F. Murray, Mr. B. Levy and Mr. V. C. Warren.

NOTES FROM THE BRANCHES

(*Continued from previous column.*)

Whiteley, Llanelly, and Mr. R. G. Williams, Cardiff; as Technical Council delegate, Dr. Bryn Jones, D.Sc., Cardiff; and as branch council members, Dr. D. Rogers, Llanelly, Mr. Herbert Cole, Abertillery, and Dr. Bryn Jones, Cardiff.

A hearty vote of thanks was accorded Mr. Kelly for his able services as branch president during the past year. With this the meeting closed.

APPRENTICE TRAINING IN THE FOUNDRY*

By JOHN B. LONGMUIR, M.B.E.
GENERAL WELFARE OFFICER, NEWTON CHAMBERS & COMPANY, LIMITED

Recruitment is one of the most urgent problems of the foundry and it must be given consideration before training and education in the foundry can be started. The company with which the Author is associated is a composite concern made up of collieries, chemical works, and engineering works. There is, therefore, a wide range of jobs open to youths, and the firm is in an excellent position to ascertain the order of preference of the applicants from the villages round the works.

It is a matter for regret that moulding is last on the list. Boys prefer the pits to the foundry. The boys who apply for jobs have obviously been warned by their mothers, for whenever moulding as a possible opening is mentioned, their reply is an emphatic "No." Is it fair that dirt should be taken home night after night by the foundry employees? It is the Author's considered view that the foundry industry will not attract the right type of youth until energetic steps are taken to leave dirt in the foundry, by the provision of washing facilities, lockers for clean and dirty clothes, and time during working hours to get rid of the dirt. There are other improvements which are overdue, some of which may be the subject of factory regulations in the near future. As a means of attracting young entrants of the best type to the foundry, the setting up of a training scheme cannot be too strongly recommended.

Training Centre Set Up

At the beginning of 1944 there were thirty apprentices in the foundry, but the number of good-boy applicants for the foundry was nil, until in August it was decided to set up a training centre for the foundry on the same lines as had been so successful for apprentice miners and engineers. As there was something concrete to offer, 12 boys, including three secondary school boys, were persuaded to give moulding a trial, and they started in the August pre-entry training class, along with apprentices for other trades. By the end of the four weeks' training period the foundry training centre was equipped to start. Since that date 61 boys have been recruited for the foundry, and at one period there were no vacancies for apprentice moulders.

It must be admitted that it has not been possible to keep all the boys, and 13 have left; some for other foundries nearer their home; some to other trades; some on medical grounds; and some, unfortunately, asked for transfers to the pits. There is no doubt that conditions in the foundry, coupled with discouragement from some of the men, had something to do with their desire to leave. Fortunately, some of the best boys have remained.

The lesson from this is that, if the industry is to retain the boys, some improvement in the conditions of the foundries is essential and urgent. Steps must also be taken to dramatise the foundry and emphasise that it is a basic industry and therefore of great national importance. More attention must be devoted to the recruitment of first-class boy entrants, to their training, and to the day-to-day treatment of foundry personnel, all of which must be in the hands of a senior official of the company.

Training a Continuous Process

Education and training is a continuous process which goes on throughout life. This gradualness of training may be the reason or excuse for the almost complete lack of systematic and consecutive training in British industry. It is emphasised that human beings are not born with any manual or other skills. They only possess the capacity to develop a surprisingly large range of skills. A great effort has to be made to bring out these skills by systematic training and instruction.

During the last few years the ordinary man and woman performed miracles in every theatre of war. It was said, over and over again, that the men and women in the Services were splendid. The men and women in industry to-day are equally capable of being splendid. Have they had a chance? The training for the war was both thorough and imaginative. No trouble or expense was spared. Before a battle every man was "put in the picture" and given a clear objective. What was the result? Our men were irresistible and always reached their objectives.

If the same thoroughness and imagination were put into the training of the men and women of the industrial army, the fiercest foreign competition could be faced with confidence. Every company, great or small, is urged to enter this education business wholeheartedly. It is the most direct way of improving the morale, the efficiency, and the well-being of the individual worker. Every company whose declared policy is to do everything possible to look after the human element in industry cannot do better than follow the splendid example of the Services in this matter of education and training.

No company which makes a serious attempt to set up and run its own education scheme will ever regret it, for it is a stimulating and satisfying experience. The time is ripe for the experiment. A firm's personnel policy must be based on a carefully-thought-out plan of training, and built on the solid foundation of the day-to-day interest of the managing director and other high executives; otherwise it will not be possible to secure a regular flow of entrants and to equip them adequately to fill the complete range of jobs, and the executive and administrative positions in the company.

* A Paper presented at a meeting of the Birmingham, Coventry and West Midlands branch of the Institute of British Foundrymen, Mr. E. E. Dickinson presiding.

Apprentice Training in the Foundry

Looking Ahead

The boy of to-day is the foreman and manager of to-morrow, and if he is to be equipped and given a real mission in life he must secure the right kind of attention and consideration from the moment he enters the service of the firm. Boys must be regarded as precious, they must receive guidance and help from the start. To allow a boy to grow to manhood only to be classed as a labourer is a sad reflection on all responsible people in industry and commerce.

The first step, therefore, in setting up a training scheme is to make arrangements for the careful selection of the boy from school. Even if a whole day is spent in doing so it is time well spent. Many years' experience in selecting apprentices for the engineering industry has convinced the Author that interest in a job is the mainspring that drives a boy upwards. It is more difficult to select a boy than a man who has had some industrial experience. The selection of the boy should therefore be carried out by a senior member of the management.

Method of Selection

The following are the steps, in chronological order, taken by Newton Chambers & Company in selecting and grading youths:—

(1) A preliminary personal interview by the superintendent of apprentice training. This interview is not hurried and the boy is encouraged to talk about himself in an effort to ascertain his real occupational desires. If he has any clear desire for a particular job and it is based on some knowledge of it, he must be given a chance, if a vacancy exists. If he has no definite objective then the available openings should be explained to him, and, if necessary, by a visit to the works itself. There are so many different kinds of jobs open to boys in this establishment that it can employ every fit and healthy boy who applies.

(2) Eyesight and medical examination follow.

(3) On a subsequent date applicant undergoes, with others, a series of three intelligence and other group tests.

(4) This is followed by a series of manipulative tests to ascertain mechanical aptitude, manual dexterity, special perception, etc.

(5) Finally, there is a personal rating interview, which together with the other tests fixes his grading as A, B, C, D or E.

This grading is an essential and important factor in any scheme of training. One cannot expect grade A work from a grade E boy, and one must see to it that grade A work is had from a grade A boy, otherwise he will not be fully stretched and one will not bring the best out of him. This grading is not a brand for life but is a tool for the proper training of the boy, to be used solely in his interest. The boy is now ready to start his training in this training scheme, which it is proposed briefly to describe.

Pre-Entry Training Courses

It is recognised that the change-over from school to work is a difficult and trying period for boys, and that this transition must be made easy. After some experience and much consideration the conclusion was reached that the only satisfactory way to ensure that every boy received an adequate welcome and obtained the necessary information in a systematic and consecutive way was to institute full-time pre-entry courses of four weeks. These have been set up for the following three main types of entrants:—Mining; engineering—all trades, and office juniors.

All junior entrants must attend those courses before they are allowed to start work. They are held at least four times annually at school leaving periods. These courses have been drawn up with great care, and they are an outstanding and important feature of the training scheme. Every section of the concern is visited, and approximately 50 senior executives and managers give talks on their jobs to every class.

Teamwork and Leadership

The importance of developing leadership early in the young person's career is recognised, and every class is divided into four or five teams of four. One is appointed leader, and another deputy, and all members of the team are given titles, depending on the type of course. Each team has a distinctive colour, and all equipment is distinguished by the team colour. The flag of the winning team for the day is shown, as well as for the winning team of the week. This has been one of the most successful innovations in the scheme.

It is intended to be a memorable experience for the young entrant, and it is believed that from the first day, work is anticipated eagerly and happily. This course creates a good impression on the young people who, secure in the knowledge that they will be welcomed by friends in their new department and that a serious attempt has been made to get to know and understand them, will face their industrial life full of interest and eager expectation.

Visual aids are extensively used to make the pre-entry courses vivid, memorable and interesting. The terminal examination, which is oral, is just as much revision as an examination. Marks are also given and observations taken during the course by the teachers and instructors.

Goodwill Secured from the Start

One of the advantages obtained from this pre-entry training is the knowledge obtained of the capabilities and character of each youth. The youth also gets to know many members of the management, and as a result will have confidence and trust in them. This alone would justify pre-entry training, and no firm, great or small, can afford to ignore the important benefit of securing the goodwill of all employees from the start.

Vocational and Practical Training

Immediately the pre-entry four weeks' course is completed, the trade or occupational training commences in the appropriate training centre—business, foundry, engineering, mining, structural and welding, and painting and decorating. The apprentice moulder now has some indication of the importance of the foundry in the scheme of things, and he is ready to start his craft training by undergoing a four weeks' course in the foundry training centre. This is followed by a period of five months in the foundry on actual production under a skilled workman or instructor. Then another four weeks' training, followed by a further period of five months in the foundry and then a four weeks' course, and so on until he is 18.

Instruction to Keep Step with Practical Work

This ensures that training does not get too far in advance of the kind of work the apprentice will be expected to do in the foundry, and makes more certain that he will get a change of work every six months. The foundry training centre is housed in improvised buildings situated in the middle of the foundry. This proximity is extremely important, for it makes training an integral part of management, associates every member of the management with it, and makes the instruction more realistic.

New Methods of Training Necessary

Methods of training have received special consideration and they will be enlarged upon later. As every boy must be treated as an individual, the size of the classes is reduced to eight. Twelve has been found to be too many for satisfactory training.

Tidiness.—The economic value of tidiness is emphasised, and in every training centre there is a place for everything and everything in its place. Team marks are lost for untidiness, either in personal appearance or in workshop, or in lecture room.

Overalls and Safety Boots.—To encourage apprentices to be tidy and to have some pride in their appearance, each apprentice is provided with a new suit of overalls, gaiters and a leather belt.

Tools and Instruments.—These are supplied at half actual cost.

Apprentices' Committee.—A committee of the apprentices meets regularly twice each month. Every question affecting the interest and welfare of the apprentices, except wage rates and conditions of work, which are the subject of national agreements, is discussed. Each department elects, by ballot, a representative to this committee.

Gymnasium and Shower Baths.—Every apprentice in attendance at any of the courses receives one hour's physical training daily. This training is in accordance with a new system of applying the training to the needs of the job, and so secures the interest of the apprentice. The craft instructor is usually in attendance with his class in the gymnasium.

A physical training record is prepared for each apprentice. This contains the measurements and the results of the tests and shows progress and details of games played in his leisure time. No elaborate gymnastic equipment is used in the gymnasium, and special attention is devoted to the development of hand-and-eye co-ordination by the right kind of exercise and games. The muscles and the co-ordination of hand-and-eye required by each trade or occupation are studied and appropriate exercises introduced to strengthen the muscles and to develop co-operation, team work, and comradeship. A new requirement of modern foundries is washing facilities, and in some of our industries—mining, chemicals and welding—shower baths are now provided. It is desirable that instruction in the correct attitude and behaviour in this communal form of personal cleanliness should be given. Shower baths of the latest design have been installed under the gymnasium, and every apprentice has an opportunity of taking a shower bath after physical training or games or after return from work underground. Individual towels, and racks for drying them, are provided, and the apprentices are instructed in personal hygiene and in the precautions to take in bathing.

Record of Training and Progress

As soon as a boy is engaged, an individual record card is prepared. This contains information about his family, relations in the service of the company, school report, hobbies, social activities, etc. His grading or intelligence quotient and the results of the manipulative and psychological tests are added. On this card is added from time to time all information such as dates of letters to parents, good and outstanding performances, four weeks' course reports, timekeeping, evening and day class reports and amount of bonus earned, quarterly workmanship reports, suggestions submitted, accidents, exceptional illnesses; good marks are inserted in red ink and adverse reports in pencil.

Promotion and Advancement.—Inequality of opportunity for promotion and advancement is often quoted as a source of unrest in industry. While efficiency and energy cannot long remain in obscurity, it must be admitted that injustices and favouritism do exist. The most effective way of avoiding such injustices is by the keeping of careful records and by utilising such records when promotions are being considered. It is claimed by many that they possess the ability to size people up: such claims are humbug. What they usually possess is a defective memory—they remember their successful promotions but forget their failures. There is nothing mysterious about making or recommending promotions. The only satisfactory test is the test of time, *i.e.,* the candidate's record of past performances in pre-entry, craft training course, workshop, office, night-school, college and university, over as long a period as possible. Such a record, compiled over the whole period of the candidate's service, is of greater value than one compiled from memory at the time the advancement is being considered.

Vitalising Influence of a Clear Objective

There is nothing more vitalising than a clear objective, and if firms wish to mobilise the brains and the abilities of their employees and have a reservoir of talent from which to draw, steps must be taken to see that every youth has a clear objective, that he under-

Apprentice Training in the Foundry

stands the educational ladder and how to climb it. His plan of progress upwards should be discussed with him and every step recorded and acknowledged. He should be made aware of existing educational facilities provided by the local authority and others, and he should receive advice and encouragement. It should be made clear that he is expected to do something " off his own bat." He should aim at securing national certificates and of reaching definite stages, in the right order to suit his capacity—City and Guilds, Royal Society of Arts, National and Higher National Certificates.

Bonuses and scholarships are available for students, who keep to the recognised ladder, but if they do not, financial help should be offered for recognised courses of study, and it is the firm's intention to send likely boys to attend the six months' courses arranged by the British Foundry School when it resumes. It is a sound investment, and the fear that boys will leave when they qualify is not well founded. It must be remembered that during the formative years young people make friends of a lifetime. They will be reluctant to leave their friends, especially if there is in evidence reasonable chance of advancement, and a plan for promotion.

Instructor.—The selection of the right man as instructor is of great importance. The first essential must be a love of boys and the capacity to interest and inspire them. He must be guide, philosopher and friend to the boys. He should be firm but kind with them and capable of imbuing the boys with his enthusiasm. It is no exaggeration to say that training in the foundry stands or falls with the selection of the right man as instructor.

Upgrading Committee, or Training Advisory Committee.—There is a danger that the training centre may become divorced from the foundry. This can be avoided by the setting up of an upgrading or training advisory committee, consisting of representatives of the foundry management and of the foundry employees. Their services are used as assessors in the oral examination which is held at the end of each four weeks' course,

NEWTON CHAMBERS & COMPANY, LIMITED
FOUNDRY TRAINING CENTRE

First Course Time Table. First Week.

Time	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
7.30 A.M.	Inspection Boots.	Inspection Teeth.	Inspection Hands.	Inspection Hair.	Inspection Fingernails.	General Inspection and Team Marks.
7.45	Introductory Talk Team Selection. Distribution of Foundry Badges.	Talk " The Creative Art of Moulding."	Lecture " Open Sand Moulding."	Lecture " Foundry Sands and Clays."	Lecture " Two Part Moulds."	Talk " Foundry Hazards."
9.00	MORNING BREAK—COCOA and CHEESE ROLLS					
9.15	Mental Agility Competition.	Kim's Game. Memory Test.	Quick Questions.	Competition, " Odd Man Out."	Weight Estimation.	Competition, " Danger Points."
9.45	*Workshop* Tool Distribution. Sand Mixing and Conditioning.	*Workshop* Tool Manipulation.	*Workshop* Open Sand Moulding Practice.	*Workshop* Simple Bench Moulding.	*Workshop* Two Part Moulding.	Cleaning. General Assembly. Basket Ball.
12.00 NOON	LUNCH HOUR					DISMISS
1.00 P.M.	Talk " The Moulders' Job."	Isometric and Free Hand Sketching.	Notes and Sketching.	Microscopic Study of Sands and Sand Testing in the Laboratory.	Manual Work.	
2.00	*Workshop* Ramming Practice.	Smoothing and Sleeking Practice.	Visit Open Sand Moulds in the Foundry.	Notes.		
2.45	*Speaker* Heavy Castings Dept. Manager.	*Speaker* Light Castings Dept. Manager.	Educational Films.	*Speaker* Assistant Foundry Manager.		
	PHYSICAL EDUCATION HOUR					
3.30	Foundry Table. Warm Up and Free Hand Exs. Dexterity— Tennis Ball. Strength— Long Sticks.	Daily Table Games.	Dexterity—Quoits. Strength— Medicine Ball. Agility— Swinging Bag.	Daily Table Games.	Relay Races and Team Games.	
4.30 to 5.00 P.M.	DISCUSSION : READING : DISMISS					

CHART I

to give talks to the boys, to advise in movement of apprentices within the foundry, and generally to take an interest in each individual boy and his progress. Their help in devising trade tests for each year of apprenticeship, which are gradually being introduced, is invaluable.

Premises

The Foundry Centre is in the middle of the foundry. It consists of a workshop approximately 32 feet square, enclosed from the main foundry. This is equipped with a Cummings 100-lb. capacity coke-fired crucible furnace; a moulding machine (Molineux pneumatic jolt squeeze type); six moulding benches; three sand pits; racks for boxes and patterns; two sets of sand bins; and individual clothes lockers and toolboxes for the boys' tools, complete the equipment. Colour has been used to brighten the workshop with satisfactory results.

There is a lecture room opposite, approximately 26 ft. by 15 ft. by 15 ft. high. It has individual chairs, showcases, cupboards, and again colour is used. "Cool" colours predominate, which help to cool the boys down after the heat of the foundry. Off this lecture room a laboratory has just been built. It has been equipped with a microscope, film projector, Speedy moisture tester, permeability equipment, compression tester, scales, and mould hardness tester. It is expected that this installation will convince the boys that moulding is a scientific business and that rule-of-thumb methods are no longer acceptable. Quality control must be the day-to-day practice and not the exception in the foundry.

Syllabus and Time-table

The first week's time-table is reproduced in Chart I, and a reference to it will show the character and method of the training. It will be noted that the day starts with inspection and that lectures alternate with practical work and exercises, and so on. After inspection there is a talk, and it will be noted that this is elementary. At the end of every talk there is a period for questions. This is no mere formality; the boys are tongue-tied at first, but by the end of the first week they have lost their shyness. The next period ("Cocoa and Rolls") always receives close attention. After the lunch they are ready for mental agility exercises. These are good fun, but have also some practical application. Practical work follows till lunch time, and it will be noted how it progresses. The first week they cast some little gadget of their own. After lunch there is another talk, followed by more work. At 2.45 p.m. a speaker other than their instructor talks to them. The final period is spent in the gymnasium. The apprentice moulders always get the benefit of the last period in the gymnasium, so that they can go home clean. It is emphasised that it is not a technical college, but a craft school, where every effort is made to teach the boy and not the subject. It is the aim to raise the level of the ordinary boy and not to concentrate on the 10 per cent. who will be managers and higher executives.

Every kind of visual aid must be used to make the work of the class interesting and vivid, *e.g.*, specimens, models, film strips, slides, pictorial sketches and charts, microscope, magnifying glasses. Only the best equipment should be regarded as good enough if good quality work is expected. Lectures must not be too long and they must be followed by a spell of physical work so that the boys can work off their rapidly developing energy. The whole resources of the welfare department are available to the boys. There is frequent inspection by a doctor. The physical training instructor sees them stripped every day in the gymnasium, and everything is done to make the boys feel important and very much worth while.

Response from the Boys

The boys are responding to this treatment. They are lively, clean, tidy and happy. They are more interested in their work and we sincerely believe that the system is encouraging them all to give of their best and to make the maximum use of their abilities. The firm is confident that by the methods described it is obtaining a regular flow of keen boys, who will supply the personnel requirements of the foundry and fill all the executive and managerial positions as they occur. The appointment of a recruitment, training and education committee for the foundry industry with a full-time staff is strongly urged. The preparation of strip films, loop films, charts, models and other visual aids could be one of the committee's first tasks.

One of our greatest handicaps in setting up the training schemes has been the lack of a central authority that could give advice and such practical help. Up to date the firm has been able to purchase one strip film for the foundry training, whereas for mining training there are at least thirty strip films in regular use, three ordinary films, and about thirty specially prepared pictorial charts. The mining industry is the only industry so far that is taking this matter seriously. This kind of help has been of tremendous value to us in the firm's mining training and similar arrangements must be made for other industries if recruitment and training are to be effective.

SILICOSIS COMPENSATION SCHEMES

Five new orders made by the Ministry of National Insurance under the Workmen's Compensation Acts and published by the Stationery Office amend the silicosis and asbestosis schemes in the metal-grinding and other industries. They provide that for the purpose of certain provisions of the principal scheme any period between September 3, 1939, and March 31, 1946, during which a workman has been engaged in any service or employment which he would not have undertaken but for the war, shall be disregarded.

The amendments are published as S.R. & O. Nos. 591-5 and relate to the following schemes:—Sillicosis and Asbestosis (Medical Arrangements), Various Industries (Silicosis), Asbestos Industry (Asbestosis), Metal Grinding Industries (Silicosis), Sandstone Industry (Silicosis).

THE USE OF NON-FERROUS TURNINGS IN FOUNDRY PRACTICE*

By R.H.B.

Recovery of large quantities of turnings.—In dealing with large tonnages of copper alloy turnings of uncertain composition, it is always advisable to begin with a preliminary conversion into ingots, assuming, of course, that a large capacity furnace is available. By casting into ingots it is possible to obtain the average analysis of a sufficient quantity of metal, which is always very difficult to obtain when dealing with turnings. When the ingots are remelted the necessary additions can be made to give the desired chemical analysis.

The furnaces used are usually of the Charlier or S.P.E.M. types, that is, horizontal cylindrical furnaces, fired by oil, town's gas or pulverised coal. Easy charging, quick melting and agitation of the bath by rocking during melting, as well as the large capacity of this type of furnace, make them generally more suitable than other types. Moreover, in these days, the fact that no crucibles are required, only a well-rammed silico-aluminous lining, is a valuable factor. When melting is completed, the metal is cast into ingot moulds and drillings are taken for analysis from a certain number of ingots (1 in 5, 10 or 15 according to size of melt).

Day-to-day recovery of small quantities of turnings without special melting facilities.—It is possible to get good results on a smaller scale without special furnaces, provided the following conditions are observed:—

(1) Exact knowledge of the source and analysis of the turnings received.

(2) Orderly and clean conditions of storage and transport of these turnings.

(3) Assurance of very thorough degasifying and de-oxidation of the molten alloy.

A fixed percentage of turnings is included in the charge, say, up to 30 or even 40 per cent. of turnings in the charge melted for casting individual articles. It is, however, advisable to begin with a smaller percentage of turnings, say, 20 per cent.

The following practice should be followed:—

(*a*) Heat the empty crucible to red heat and throw in a shovelful of crushed sodium carbonate to cover the bottom of the crucible.

(*b*) Put the turnings in all together, if possible, and add, say, half a shovelful of sodium carbonate. Cover the preheater extension with a piece of old crucible and let the turnings melt. If all the turnings cannot be charged at the beginning, further additions should be made as soon as the reduction in the height of the charge makes room for them. It is advisable to cover each addition of turnings with a handful of sodium carbonate.

(*c*) When all the turnings are melted, the virgin metal and scrap are added in the usual way and melting is continued as for an ordinary charge.

(*d*) When the alloy is melted and brought up to a temperature high enough to ensure the satisfactory running of castings no matter how thin, very thorough de-oxidation and de-gassing must be carried out, especially if the turnings had been greasy or oily, as often happens. De-oxidation can be done either with phosphor-copper (7 to 8 ozs. of 13 to 15 per cent. P for 100 lb. of alloy), or with magnesium. (See the author's previous paper on "The Use of Phosphor-Copper in Bronze Founding"—Bureau de Documentation du Centre Technique des Industries de la Fonderie.)

Whatever de-oxidising or reducing agent be used, care must be taken to see that it gets well into the heart of the melt by pushing it in with a graphite bell-shaped stirring rod or even with a steel stirrer if there is no risk of the alloy being affected by the presence of a small amount of iron. Care must be taken to see that the whole mass of the melt is affected by the agitation of the stirrer.

Additional degasifying can be ensured by allowing the alloy to cool down below casting temperature and then heating up again quickly to the required temperature and casting immediately. This can only be done if the furnace is sufficiently responsive to allow of a quick reduction in temperature and of an equally quick recovery to the required casting temperature.

*Translated from the March, 1946, issue of "Fonderie."

NEW CATALOGUE

Reduction Gear. A four-page illustrated leaflet received from C. J. Fitzpatrick & Company, Limited, of Stonebridge Park Works, North Circular Road, London, N.W.10, describes a range of combined motors, and double or triple reduction gear capable of being mounted in almost any position. With double reduction, "Motogear," to give it its trade name, operates at about 96 per cent. efficiency, or with triple reduction between 94 and 95 per cent. It is stated that these efficiencies should be maintained throughout the whole life of the unit.

PUBLICATION RECEIVED

The K-B War Effort. Published by Keith Blackman, Limited, Mill Mead Road, Tottenham, London, N.17. This publication is particularly welcome, as, unlike some, it is no catalogue of large scale production of standardised munitions, but a human document which correlates some of the more exacting war achievements with the work done by Tom, Dick and Harriet, their foremen, managers and employers in their own shops. Rightly they have published a few testimonials from the *gross legumes*.

PRIOR TO 1940, sand to the value of over £200,000 annually was imported from Belgium, Holland and France. Much of it was used in glass manufacture, and after Dunkirk there was an acute need for substitute sand, in particular for very pure quartz sand for the manufacture of optical glass. The Geological Survey discovered and assisted in the development of a large deposit of sand at Lochaline, on the Sound of Mull, whose purity exceeds even the best of the Continental sands; the dangerous shortage was fully met and there are adequate resources for the future.

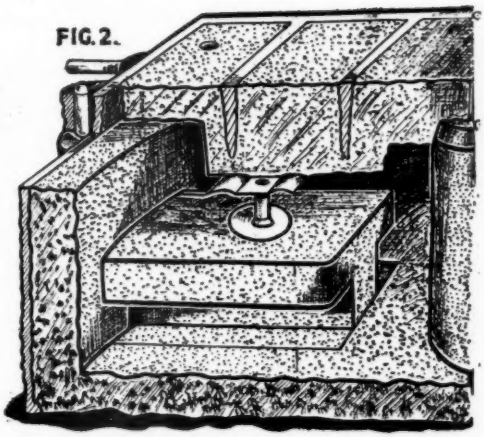
USE OF CHAPLETS

By JAMES TIMBRELL

Best quality chaplets are a prime necessity for the production of intricate thin-sectioned castings, and are inseparable from mechanised production, where complete sets of cores are assembled and checked in "master" moulds, by jigs and with core-setting gauges to ensure that all parts of the casting are true to sectional dimensions. This core and mould inspection and checking removes any necessity for the closers to try cores "in-and-out," and top-half moulds "on-and-off" to check chaplet contact.

There still remains, however, a variety of ordinary semi-jobbing cored castings, where master moulds and core jigs could not be an economical proposition, with some specifications, small core-making and mould-finishing differences, are tolerated, and not considered detrimental, these differences usually make slightly thicker sections. It is for this class of castings that the choice of chaplet (or stud), how many, and where to place, is left largely to the discretion of the closer. It is a system which invites occasional trouble from "lift" and leaking on pressure-tested castings.

FIG. 2.



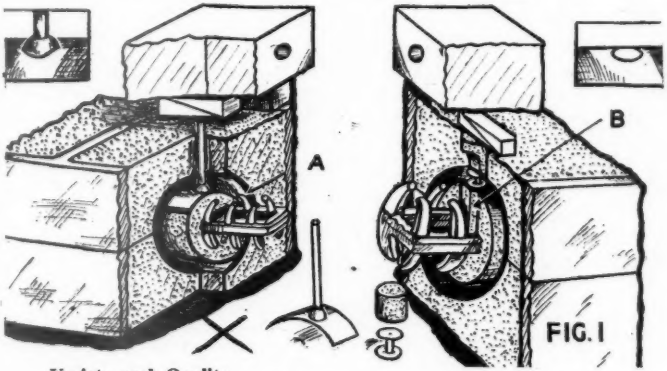


FIG. 1

Fig. 1 shows how dried core and a standard type chaplet can be used to replace the stalk chaplet. This removes the trowel handle "blobs," still evident on many pipes and the like. The core may be placed on the main core grid, as shown at B, whilst other uses of the idea will suggest themselves.

Fig. 2 shows a type of non-crushing chaplet for use where the core-making and mould-finishing make the small differences mentioned. This style of chaplet removes the necessity for trying moulds "on-and-off," where the section is known, say, as 9/16ths. The ¼-in. stem size

Variety and Quality

The variety of chaplets available is a comprehensive one, although the standard of quality, in certain types, leaves something to be desired in the direction of true standardisation quality. With dried moulds, the number of chaplets per job may be fewer than in green moulds, according to the area of pressure, lift, etc. For the green moulds, hard core can be rammed up in the appropriate place, and will provide adequate security for support, weighting, or wedging-down can be more safely accomplished.

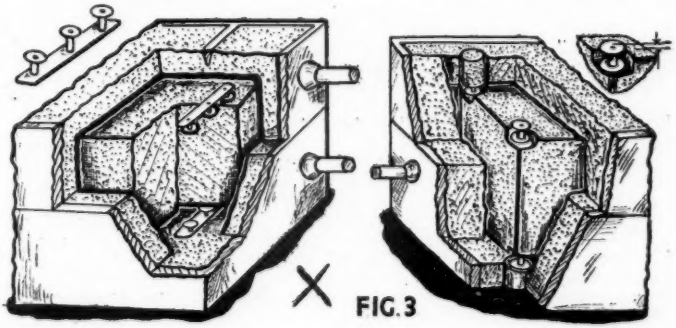


FIG. 3

Use of Chaplets

will take up the small differences, usually taken up after a "try on" by soft clay, or tin packings. For cores with good bottom print area, "T" slots, and other medium pressure lift problems, these chaplets are quite suitable. Incidentally, they are less discernible in the castings than the round washer type.

Thin-sectioned Castings

On thin-sectioned castings with a large area of lift multiple chaplets are sometimes used in green moulds, as shown in Fig. 3. These multiple chaplets are not the best for pressure-tested castings, and they can be advantageously replaced by using internal "spot faces" in the core boxes—for example, say, 3/16ths section—by placing a 5/16ths spot face in the right spot, a ½-in. standard chaplet can be used, which provides a

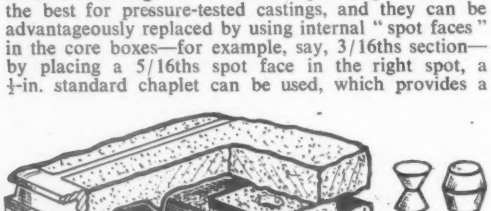


FIG. 4

stronger job and better metal fusion round the stem, with obviously less chance of "weeping" on test. By using the rammed-up cores in green moulds (tops and bottoms), as before described, fewer chaplets will be required. Chaplets should never be placed immediately in front of ingoing metal, as the stream will cut down the chaplets and allow the core to drop, or lift, as the case may be.

Fig. 4 shows two cast-iron chaplets. These chaplets may be turned from the stick, and will support the heaviest cores on suitable bearing, and on machine work, beyond a slightly higher Brinell figure, are not easily discerned. The barrel type shown are more suitable than the "diabolo" kind, because if these be broken in machining or fettling the halves fall out, leaving a funnel-shaped hole.

The hints described and illustrated will suggest other ways of using fewer chaplets with greater security.

G. HOPKINS & SONS, LIMITED, brewers' engineers, of Highbury, London, N.7, are to offer 120,000 ordinary 2s. shares to holders in the proportion of one new share at 4s. 6d. per share for every five shares held. Cash is payable in full on application.

F.B.I. ON GOVERNMENT'S IRON AND STEEL ANNOUNCEMENT

The Federation of British Industries have issued the following statement on the Government's announcement on iron and steel:—

The Government, by launching its production drive, has told the country that the task of supreme importance is the early restoration of full production and of international trade, upon which our economic survival and standard of living depend. With this, industry is in full agreement. It follows that the Government's proposals for iron and steel should be judged in that context and as a means to that end.

The Government's announcement cannot fail to do great harm to industrial recovery. It forces attention to be diverted from the production drive, and by creating doubt will cause a widespread deferment of developments throughout all those productive activities whose boundaries are overlapped by those of the iron and steel industry.

Iron and steel is not one industry, but a number of industries. Its processes vary widely, and its products and markets are almost indefinitely diversified. Its boundaries, and those of the engineering industry, are inextricably interwoven. The attempt to define them which is foreshadowed by the Government's proposals is bound to result in flexibility being replaced by rigidity, the acknowledged enemy of all progress.

Confidence and Co-operation

It is necessary for world recovery that confidence and co-operation should be the keynote of our international economic relations. Public ownership is not merely a domestic issue. It involves doubts and an attitude of caution in the minds both of foreign governments and of overseas consumers, as to the methods which this country may adopt in conducting its international trade. It would be bad for such doubts to have even a brief currency, especially just at this moment; for them to continue over some years while complex plans for iron and steel are worked out would place a very grave handicap upon the rehabilitation of world trade.

The Lord President has admitted that nationalisation must in each case positively justify itself. Unless the Government can do this, its proposals stand self-condemned. The position appears to be that the Government, having developed a political theory, is now seeking a plan to fit it. The vindication of the theory has become the main objective, taking precedence over the speedy advancement of a great basic industry.

The Government is already aware of the iron and steel industry's willingness to participate wholeheartedly in agreed official measures to safeguard the national interest and that of the consumer. Industry asks that the Government should progress along these lines. It is only in this way that the whole country can be bound together in a united drive for national economic recovery.

THE NEW SOCIAL INSURANCE SCHEME

By F. J. TEBBUTT

Under the National Insurance Bill, all persons, with only a few exceptions (*e.g.*, persons with total income of less than £75 per annum), are brought into compulsory insurance, and the existing schemes of sociology —Unemployment, Health and Pensions Insurance—come under one head with one contribution covering all the schemes, payable by one stamp, with the employer, as regards employed contributors, being able to deduct the employee's share.

The insured are put into three classes: (A) being employed persons, (B) self-employed persons (persons gainfully occupied but not employed), and (C) non-employed persons (persons not gainfully occupied in any way). Current voluntary contributors will mostly come under class (B) as being persons of similar state (self-employed), traders, persons in business on their own account generally, although some (*e.g.*, those employed but with salaries over the scale for present compulsory insurance) will go into class (A).

Contributions

The full contribution for class (A) is for persons 18 years and upwards, 8s. 5d. weekly for men, and 6s. 7d. for women; for the "under 18's," 4s. 11d. for boys, and 3s. 11d. for girls, of which the employee pays 4s. 7d., 3s. 7d., 2s. 8d. and 2s. 2d. respectively. The contribution for class (B) is for men 18 and over, 5s. 9d. weekly, and for women 4s. 10d.; for boys under 18, 3s. 4d., and for girls, 2s. 11d. The rates in class (C) are 4s. 8d., 3s. 8d., 2s. 9d. and 2s. 3d. respectively.

Benefits

For Sickness Benefit (i), Unemployment Benefit (ii), Retirement Pension (iii), the chief rate is the same for each, being 26s. for each individual, with 16s. extra if married for wife or other adult dependant (pensions, wife only), with 7s. 6d. for first child (other children come under the Family Allowances Scheme). For pension, the 16s. for wife is payable even though she is under 60 (the pensionable age is 65 for men, and 60 for women) if she is not gainfully occupied, that is, when the man qualifies. A wife, if insured herself, can draw pension as an ordinary individual, even though the husband has not retired. Other benefits are Maternity (three kinds), Widow's (three kinds), and Death Grant; space forbids details.

Qualifications for Benefits

The qualifications for (i) and (ii) are actual payment of at least 26 contributions with at least 50 paid or credited in the contribution year (runs July to July) running before the benefit year next succeeding (runs January to January); for totals less than 50 lower rates of benefit will be payable. Sickness Benefit can continue indefinitely if 156 contributions have been paid, otherwise the extent is 312 days; for re-qualification a further 13 contributions is necessary and this applies to persons exhausting benefit (ii) also. For that benefit 180 days is payable plus additional days based on contribution record, and plus any other days which may be allowed by local committees.

For a Retirement Pension (applies for widow's benefit also) at least 156 contributions must have been paid since entry into insurance to pensionable date and there must be a contribution average of 50 (average reckoned by dividing the full number of contributions throughout insurance by the number of contribution years to the pensionable date). Reduced pension rates will apply with averages less than 50. An important pre-requisite for Retirement Pensions, however, is that these are not payable while the insured persons remain at work or in business, even though pensionable age (65, men, 60, women) is reached, but earnings up to 20s. per week are disregarded for this condition (as regards small earnings, for every 1s. earned over 20s., 1s. is knocked off pension). That is between the age of 65 and 70 (60 and 65, women); at 70, however (women 65), pensions are available whether work is continued or not irrespective of earnings. Where pensions are not taken between 65 and 70, however, class (B) persons are eligible for Sickness Benefit (class (A), Unemployment Benefit in addition), but on the other hand contributions are payable in these cases.

Special Points

If a man is over 55 (a woman, 50) at the start of the new scheme, a Retirement Pension is not payable until ten years' insurance is registered, even though 65 (or 60) is reached earlier (thus really the qualification for a pension as regards this condition is ten years' or more insurance) and to qualify, contributions must be paid after 65 even though retired (rates as a non-employed person).

For those now insured, but under pensionable age, the conditions for pension will be at least five years' insurance and 104 contributions paid since entry into insurance, plus a contribution average of 50; if under 50, average pension will be modified.

Current Old Age Pensioners will continue with the present 10s. weekly (plus, if insured, 10s. for wife), even if working and earning any amount; if not working or with earnings not over £1 a week, the new rates will apply, that is, up to age of 70; at 70 the new rates apply in any case. Non-contributory pensioners (aged 70 and over) will participate in the increased rates.

Unemployment Benefit

Unemployment Benefit is not available to class (B) persons (only to class (A)), and Sickness Benefit is only payable after the first 24 days of sickness (class (A) waiting days—three days), so that short periods of illness will not qualify, but all the other benefits are available, but the retirement rule for pensions is a condition which will doubtless prove a "fly in the ointment" for most class (B) persons.

Arising from this, it is debatable whether present voluntary contributors are not better off under the present Acts, with Old Age Pension of 10s. per week (with 10s. for wife) at 65 (wife 60), whether in business or not, and irrespective of amount of earnings, and with Sickness Benefit (for those insured for Health Insurance) payable up to 65 on the fourth day of sickness. Furthermore, contributions now finish at 65.

PERSONAL

MR. GEOFFREY BARLOW has been elected a director of Meters, Limited, of Manchester.

MR. H. T. COLLINSWOOD has resigned from the board of the Harland Engineering Company, Limited, Alloa.

MR. J. G. ARTHUR has been elected a director of the Trussed Concrete Steel Company, Limited. He has been appointed managing director.

MR. E. W. LEAN has been appointed chairman and managing director of Associated Clay Industries, Limited, in place of the late Mr. George du Cros. Mr. P. Sellars has been elected a director.

SIR ROBERT ROBINSON, president of the Royal Society and Waynflete Professor of Chemistry at Oxford University, is to have the honorary degree of Doctor of Science of Sheffield University conferred upon him.

MR. GEORGE W. BOOTH, managing director of Tyseley Metal Works, Limited, Birmingham, has received an illuminated address, signed by departmental heads and members of the office staff, in recognition of the example set by him during the war years.

DR. R. GENDERS has recently relinquished the post of Superintendent, Technical Applications of Metals, Ministry of Supply, in order to take up private practice as a consultant on materials and research. He has been retained as Metallurgical Adviser by the Ministry of Supply.

MR. W. A. GREEN, who joined the staff of Hadfields, Limited, Sheffield, in 1891, is shortly to retire. He has represented the company in Birmingham and the South Midlands for 45 years. Mr. Green will be succeeded by MR. C. F. JARRATT, who was, until recently, area progress officer to the Admiralty Director of Armaments Supplies.

MR. C. T. TENISON has been appointed chairman and managing director of William Cumming & Company, Limited, manufacturers of foundry blacking, plumbago, etc., of Glasgow and elsewhere, in succession to the late Mr. Henry Winterton. Mr. Tenison, who is a New Zealander, was about to return home when war broke out, but instead joined the board of the company and was appointed works manager of the Deepfields Blacking Works, near Bilston, Staffs., of the company. He is a graduate of the Canterbury Engineering College, University of New Zealand, and has travelled widely in the Far East and Australasia.

ALUMINIUM PURITY PREMIUMS

The Ministry of Supply announced last month that the selling price of virgin aluminium of 99 to 99.5 per cent. purity had been reduced to £67 per ton, delivered consumers' works, with premiums for purities. It is now stated that prices, per ton, for metal of higher purity than 99.5 per cent. are:—Minimum 99.6 per cent., £75; 99.7 per cent., £79; 99.8 per cent., £84; 99.9 per cent., £117; 99.99 per cent., £167.

NEW STEEL CONTROL ORDER

SOME PRICE ADJUSTMENTS

The Control of Iron and Steel (No. 48) Order, 1946, made by the Ministry of Supply, came into operation on Monday. It removes the restrictions on the acquisition of ores and concentrates and residues of molybdenum, niobium (columbium), tantalum and vanadium, and on the acquisition of prime barbed wire and certain wire products, and increases to 2 tons, or £70 in value, the quantity of plain wire that may be acquired without licence.

Several price changes are also made. Ferro-tungsten is reduced in price from 6s. 10d. to 6s. per lb., and 98/99 per cent. tungsten powder is reduced from 7s. 4½d. to 6s. 7½d. Shell steel billets for direct forging with over 0.30 per cent. up to and including 0.35 per cent. carbon are increased to £17 17s. per ton. High-speed steel and substitute high-speed steel are reduced in price, the new rates for bars being:—14 per cent. tungsten, 3s. 4d.; 18 per cent. tungsten, 4s. 4d.; 22 per cent. tungsten, 4s. 10d., per lb.

Increases are made in the maximum prices of square, acid-steel blooms to Admiralty specifications; wire rods containing more than 1.20 per cent. carbon; colliery arches with fishplates, but without bolts and nuts; certain qualities of cold-rolled strip; certain qualities of bright steel bars and flats; certain qualities of tinplate; flat and half-round mild-steel wire, silico-manganese wire and patented wire; wire rope (consequential on patented wire increase); certain steel castings; steel railway axles and assembled wheels and axles; and file steel containing more than 1.20 per cent. carbon.

Reductions are made in the maximum prices of basic-steel axle blooms; high-speed steel drill rods; and certain qualities of bright steel bars and flats.

D.S.I.R. DEVELOPMENTS

NEW RESEARCH PROJECTS

Lord Riverdale, chairman of the Advisory Council for Scientific and Industrial Research, speaking to the Parliamentary and Scientific Committee last week, said that industry was certainly ploughing back a proportion of its profits into research. Referring to the expansion of the Department of Scientific and Industrial Research, he announced that two new research projects had been sanctioned. One of our most valuable exports, he said, was civil engineering work, such as dams, harbours, docks, and irrigation schemes. There was no existing research organisation to investigate "loose boundary hydraulics," the movement of fluids in channels or streams, so the department was to set up an organisation to undertake this work. The organisation would aim at keeping British engineers pre-eminent in this field. The other new research project related to mechanical engineering. Although a large volume of research was already being undertaken in this field, there was need for concentration of research on certain basic problems, such as vibration, lubrication, and heat-transfer.

STANTON-DALE
REFINED PIG IRON

Manufactured to guaranteed analyses in seven standard grades. Also obtainable to individual specification

THE 14-TON CASTING ILLUSTRATED IS ONE OF A SERIES MADE IN A STANTON FOUNDRY FROM STANTON DALE IRON

1. Core being lowered into mould
2. Pouring the metal
3. Finished casting in transit

The
STANTON IRONWORKS
COMPANY LIMITED
NEAR NOTTINGHAM

NEWS IN BRIEF

F. R. MARTIN ENGINEERING COMPANY, LIMITED, is being wound up voluntarily. Mr. P. F. Keens, 11, George Street West, Luton, is the liquidator.

ABERDEEN MAY resort to the use of concrete lamp-posts to meet immediate street lighting requirements, owing to the present difficulty of getting cast-iron columns.

AS A RESULT of a fire at the works of Darlington Forge, Limited, last week, the whole of machine shop No. 1 was virtually destroyed. The damage is estimated at many thousands of pounds.

THE SOUTH DURHAM STEEL & IRON COMPANY, LIMITED, stated last week that the report of the British Iron and Steel Federation on the iron and steel industry, so far as the company and its subsidiary, Cargo Fleet Iron, are concerned, would require some modification. If the proposals were carried out, the company added, dislocation of a large body of labour at West Hartlepool would result.

REFERENCE TO developments whereby Thos. Firth & John Brown, Limited, of Sheffield, will undertake finished engineering work, including rolling mill plant, mechanical and hydraulic presses, etc., was made by Lord Aberconway, chairman, at the recent annual meeting of the company. In this connection they have completed an agreement with E. W. Bliss (England), Limited, manufacturers of power presses, drop hammers, etc., of Derby.

IN HIS STATEMENT accompanying the accounts for 1945, Mr. H. G. Ash, chairman of Coventry Machine Tool Works, Limited, says that the directors had for some years been of opinion that Coventry was a district which did not best lend itself to the manufacture of non-mass production machinery such as that in which the company had specialised, and the company's forgings and other "Covmac" specialities were now being produced at Halifax.

HEAD, WRIGHTSON & COMPANY, LIMITED, Teesdale Ironworks, Thornaby-on-Tees, announce that they now have an agreement with the Arthur G. McKee Company, of Cleveland, Ohio, U.S.A., by which they can call upon the McKee Company for engineering services in the design and construction of iron and steel works plant in Great Britain and South Africa. Head, Wrightson & Company also have the sole agency for supplying "Brosius" specialities in this country.

WHILE THERE WAS now a strong demand from processing firms for steel, one-fourth of the melting department was shut down because of the acute shortage of coal, said Sir James Lithgow, chairman of William Beardmore & Company, Limited, at the annual meeting last week. After referring to the Government's plan for the public ownership of the steel industry, Sir James said he thought it would be imprudent to embark upon any long-term schemes of improvement to plant which might be swept into a general pool without compensation.

A TECHNICAL AID AGREEMENT between the English Steel Corporation, Limited, and Thos. Firth & John Brown, Limited, of Sheffield, and the Union Steel Corporation (of South Africa), Limited, which covers the manufacture of special steels, has been negotiated. Technical experts will go to South Africa to assist in the layout and purchase of plant and equipment, while South African engineers will come to Sheffield to be trained in modern production technique. Similar joint arrangements are contemplated for the assistance of other parts of the Empire.

UNCERTAINTY REGARDING the future and shortage of labour were holding up plans for the modernisation of the South Wales tinplate industry and the recapture of its export market, said Capt. H. Leighton Davies, vice-chairman of the Welsh Plate and Sheet Manufacturers' Association. The markets won by the United States during the war could not be regained until 8,000 more workers, including 3,000 key mill men, were recruited and the latest American methods of production introduced. If the pre-war six-hour shift were reinstated even more workers would be needed.

GERMAN SCIENTISTS, many of whom are leading aeronautical authorities, are coming to this country to co-operate with British scientists in hastening the development of aero-dynamics, to solve the problems created by the jet engine. The scientists, all of whom are non-Nazis, will work at Farnborough, Hants. They have been working in German research stations and will be paid the same salaries as they received there. Mr. A. Woodburn, Parliamentary Secretary to the Ministry of Supply, who made the announcement, said that this country led the world in the development of jet engines, though tremendous problems of metallurgy were met with.

THE VOLUNTARY CONTRIBUTORY SCHEME for making up the pay of employees of the United Steel Companies, Limited, who served in the Armed Forces has now been wound up. No less than £550,000 has been paid out to 5,300 men and women employees. In addition, their contributions to the company's pension and life insurance scheme, amounting to over £50,000, were paid for them by the firm during their absence. It has cost the United Steel Companies over £320,000 to provide these benefits for its serving employees. The rest of the cost—nearly £300,000—was met from voluntary contributions by employees who remained in the company's service.

THE DRY DOCK OWNERS' AND REPAIRERS' CENTRAL COUNCIL have refuted a statement in the annual report of the Liverpool Steam Ship Owners' Association to the effect that the cost of ship repairs in this country is now at least two-and-a-half times the pre-war level and that there are few parts of the world where it is dearer to repair than it is in the United Kingdom. The Council state that the shipowners' assertions, designed to be read as generally applicable, are exaggerated, and can only have the most damaging effect upon the interests of all concerned in the British shipbuilding and shiprepairing industry nationally and internationally.

THE BRITISH STEEL FOUNDERS ASSOCIATION—B.S.F.A.

—is an organisation which represents the combined technical resources of the Steel Founders of Great Britain. Its library, research and statistical departments are at your service. If you use or are likely to use steel castings, in any form, your address (private or business) should be on the B.S.F.A. bulletin list.

BSFA
STEEL CASTINGS

Longleys

NEW PATENTS

The following list of Patent Specifications accepted has been taken from the "Official Journal (Patents)." Printed copies of the full Specifications are obtainable from the Patent Office, 25, Southampton Buildings, London, W.C.2, price 1s. each.

574,296 SPOONER, E. C. R., and MAGNESIUM METAL CORPORATION, LIMITED (Permanente Metals Corporation, in part). Chilling nozzles for electric furnaces in connection with the carbothermic reduction of magnesium oxide.

574,316 STEINLE, LIMITED, L. C., and PERKINS, J. Devices for sharpening drills.

574,381 GES. ZUR FORDERUNG DER FORSCHUNG AUF DEM GEBIETE DER TECHNISCHEN PHYSIK AN DER EIDGENOSSISCHEN TECHNISCHEN HOCHSCHULE, G.T.P. Production of sand moulds for metal casting.

574,479 STEVENS, A. H. (Minerals & Metal Corporation). Iron and steel products.

574,487 MISFELDT, C. C. Method of moulding articles from metal or other material.

574,495 MALLORY METALLURGICAL PRODUCTS, LIMITED, and TUCKER, N. A. Resistance welding machines.

574,511 HALL, H. C., and WHEELER, M. A. Aluminium alloy.

574,558 BASIC REFRACTORIES, INC. Formation and repair of basic refractory linings for furnaces and the like.

574,583 TELEPHONE MANUFACTURING COMPANY, LIMITED, and PADDLE, L. H. Processes for making metallic alloys.

574,598 UDY, M. J. Production of sound metal castings.

574,636 RADIATION, LIMITED, and PICKARD, J. C. Domestic solid-fuel firegrates.

574,639 GOLDHARD, F. K., and PRENN, D. D. Injection-moulding machines.

574,652 HADDON, R. (Corning Glass Works). Manufacture of heat cast refractories.

574,664 STUSSI, J., and INTERNATIONAL SIEGWART-BALKEN-GES. Centrifugal moulding machines for the production of pipes and the like.

574,689 BRITISH TITAN PRODUCTS COMPANY, LIMITED. Extraction of iron from titaniferous ores.

574,711 LUMSDEN, J., DERHAM, L. J., and NATIONAL SMELTING COMPANY, LIMITED. Purification of zinc, cadmium and magnesium by volatilisation.

574,737 SAMUEL, R. L. Metallic coatings on iron and steel.

574,751 RADIO CORPORATION OF AMERICA. Heat-treatment of metals.

574,763 BRIGGS MANUFACTURING COMPANY. Extraction of moulds for casting metals from flasks.

574,799 ENFIELD ROLLING MILLS, LIMITED, and METZGER, O. J. Manufacture of metal cakes, billets and the like and also of metal castings.

574,829 DANKS OF NETHERTON, LIMITED, and DALGLEISH, N. Grates for the furnaces of boilers and the like.

574,953 GREENAWALT, J. E. Gas burners for use in sintering or roasting apparatus.

574,999 HOLDEN, A. DE F. Salt-bath furnaces.

PASSING OF AN INSTITUTE PAST-PRESIDENT

MR. WESLEY LAMBERT

The death is announced at his home at 4, Sussex Mansions, Sussex Gardens, Westgate-on-Sea, of Mr. Wesley Lambert, C.B.E., one of the best known metallurgists in the foundry world. The son of an editor of a London daily newspaper, Mr. Lambert received his early training at Roan School, Greenwich, and his technical training at King's College, where he received the Jelf Medal and Cunningham Prize. In 1890 he was appointed assistant metallurgist at the Royal Gun Factory, Woolwich. In 1894, the Ottoman Government employed him in the capacity of metallurgist lecturer in engineering and chemistry. For these services Mr. Lambert was decorated by H.I.H. the Sultan with the Order of the Medijidieh. Returning to London, Mr. Lambert was appointed chief metallurgist at the Royal Gun Factory. Most of his earlier activities were devoted to ferrous metallurgy. However, in 1912, he left Government service to become manager of the metallurgical department of J. Stone & Company, Limited, of Deptford, S.E.14. Thereafter his interests became purely non-ferrous. During this period he travelled very extensively, visiting the United States, South America, Russia, Scandinavia and South Africa.

Mr. Lambert was especially interested in the work of the Institute of British Foundrymen, which he joined about 1918. After presiding over the London branch, he was elected president of the Institute in 1929, the year of an international congress. Later he was awarded the Oliver Stubbs medal, and the distinction of honorary membership. In 1930 he was made a Commander of the Order of the British Empire. He retired from business some 10 years ago, since when he has been living at Westgate-on-Sea and Bournemouth. Before his retirement, Mr. Lambert was on the membership roll of the Institute of Civil Engineers, the Institute of Naval Architects, the Chemical Society, the Institute of Marine Engineers, and the American Society for Testing Materials.

His many contributions to scientific literature and the impact of his charming personality on an extremely wide circle of friends will ensure for him a prominent place in the minds of metallurgists for many years to come.

THE FIRST POST-WAR British Industries Fair will be held in May, 1947, in three sections—at Earls Court, Olympia, and Castle Bromwich, Birmingham.

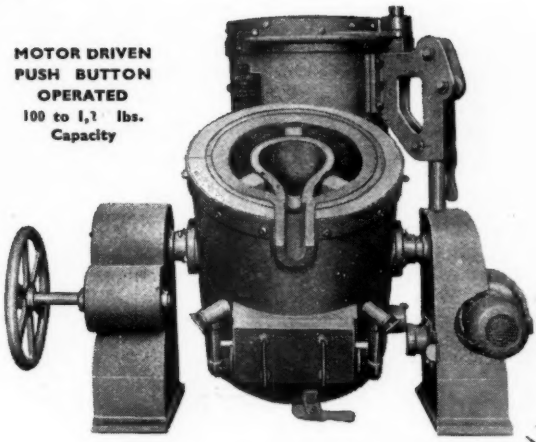
MR. BARCLAY, of Stag, Hayward & Company, 5, Giltspur Street, London, E.C.1, has been appointed liquidator for Grafton Tools, Limited, a firm operating a foundry and machine shop at Hertford.

THREE MEN WERE INJURED and one killed in an explosion in the blast-furnace department of the Carron Company, Falkirk. Without warning, metal burst through the tapping hole, and the immediate result, due to the contact with damp surroundings, was a violent eruption.

CRUCIBLE FURNACES FOR NON-FERROUS METALS

"POLFORD"
REGISTERED

RAPID MELTING HOPPER ACTS AS PRE-HEATER GAS, COKE OR OIL FIRED
100 to 250 lbs. Capacity



MOTOR DRIVEN PUSH BUTTON OPERATED
100 to 1,1 lbs. Capacity

FLEXIBILITY OF CONTROL * LOW FUEL CONSUMPTION

SOLE AGENTS

THOS W. WARD, LIMITED, Albion Works, Sheffield
TELEPHONE: 26311 TELEGRAMS: FORWARD SHEFFIELD

NEW COMPANIES

("Limited" is understood. Figures indicate capital. Names are of directors unless otherwise stated. Information compiled by Jordan & Sons, 116, Chancery Lane, London, W.C.2.)

York Metal Industries, Layerthorpe Station, Layerthorpe, York—£1,000. J. Pedley and H. Moore.

Macclesfield Engineering Company, Bridge Street, Macclesfield, Ches.—£2,000. H. S. and H. Janes.

Dodd Engineering Company, 7, Brazennose Street, Manchester, 2—£1,000. E. A. Dodd and G. C. Buckley.

Nortic Electrical & Mechanical Engineering Company, 53, Deansgate, Manchester—£1,000. A. and D. Citron.

Morco (London), 144, Packington Street, London, N.1—Metal workers, etc. £3,000. L. E. and H. C. W. Moring.

Liver Aluminium Products, Building 1A, 22, Avenue D, Kirkby, Liverpool—£1,000. S. Geey, H. Harris, and M. Berg.

Liberator Productions, 25, Temple Row, Birmingham—Metallurgists, etc. £1,000. F. Johns and N. A. Rainbow.

Earlham Engineering Company, 7, Victoria House, High Road, Goodmayes—£3,000. A. Tate and W. E. Saunders.

Kenninghall Welding Company, 54, Clapton Way, Hackney, London, E.5—£1,200. H. E. Thorp Parr and E. Parker.

Engineering Sales & Export, Abford House, Wilton Road, Westminster, London, S.W.1—£5,000. R. B. and D. Whittick.

Engineering Productions (Slough), 10, Botwell Lane, Hayes, Middlesex—£1,000. T. E. Chapman, F. H. and E. W. Dalby.

Chacksfield's (Engineers), 527, Grand Buildings, Trafalgar Square, London, W.C.2—£1,000. H. F. and E. M. Chacksfield.

Salway Morgan & Company, West Quay Road, Poole—Ironmasters, founders, etc. £5,000. A. Salway and D. F. Morgan.

Pegrex, 222-24, Lichfield Road, Aston, Birmingham, 6—Manufacturers of tools, etc. £7,000. S. L. Daniel, E. J. and M. Pegg.

Tower Engineering Company (Leeds), 30-32, Tower Lane, Armley, Leeds, 12—£5,000. N. T. Wren, L. S. and D. W. Jackson.

Robert Pearson & Company (Engineers)—£2,000. J. C. and R. Pearson, "Glenfalloch," Long Bank, Birtley, Co. Durham.

Robert Pearson & Company (Engineers)—£2,000. N.W.10—Ironmasters and founders, engineers, etc. £100. R. W. A. Frost.

Bruce Bristow (Engineers), 49, Sandy Hill Road, Shirley, near Birmingham—£2,000. H. B. and E. E. Bristow and H. Monty.

V. Wright (Leeds), 221, Hunslet Road, Leeds—Engineers and wireworkers.—£1,000. H. and S. Hindmarsh and S. Colclough.

Harker & Sons (Engineers), Danby Road, Norton Road, Stockton-on-Tees—£3,000. J. W., G. H., and F. Harker, and N. McLeod.

Davis & Sanders, Little Broom Street, Camp Hill, Birmingham—Metal pressers, etc. £500. H. R. Sanders and P. L. Davis.

Shropshire Steel, Trench Works, Wellington, Salop—Ironfounders, e.c. £25,000. K. J. Sommerfield, C. H. Batten, and H. L. Scarf.

Norman Woolhouse, Peakley Hill, Barlow, near Sheffield—Manufacturers of machine tools, scientific instruments, etc. £2,000. N. L. and F. Woolhouse, J. E. Wood, and J. H. Jackson.

Technical Industrial Specialists, 12, Norfolk Street, Strand, London, W.C.2—Mechanical and electrical engineers and machinery merchants, etc. £2,000. C. H. J. Day and K. B. Bristow.

Tube Arts, 83a, Fife Road, Kingston-upon-Thames—Engineers and manufacturers of machines, engines, tube and wire drawers, etc. £500. A. J. Gamble, D. J. Martin, and H. J. Methven.

Fulmer Research Institute—To carry out experimental and research work in metallurgy and engineering, etc. £40,000. J. Cookson, 118, Old Broad Street, London, E.C.2, subscriber.

Kent & Dring, 2, Oldknows Factory, Alfred Street, Nottingham—Machine builders, iron and brass founders, etc. £10,000. A. Kent, E. Dring, R. McAllister-Hewlings, and G. Ball.

Goodman & Vandervieren, Vanguard Works, Hadnall Lane, Little Gaddesden, Herts—Ironfounders, engineers, etc. £20,000. L. Goodman, F. J. A. and A. A. Vandervieren, and A. B. Gould.

Midland Research Company, "Ferndale," Brettell Lane, Brierley Hill, Staffs—To carry on research work in relation to metals, minerals, alloys, etc. £10,000. J. S. Tropman, H. G. Taylor, and E. Wood.

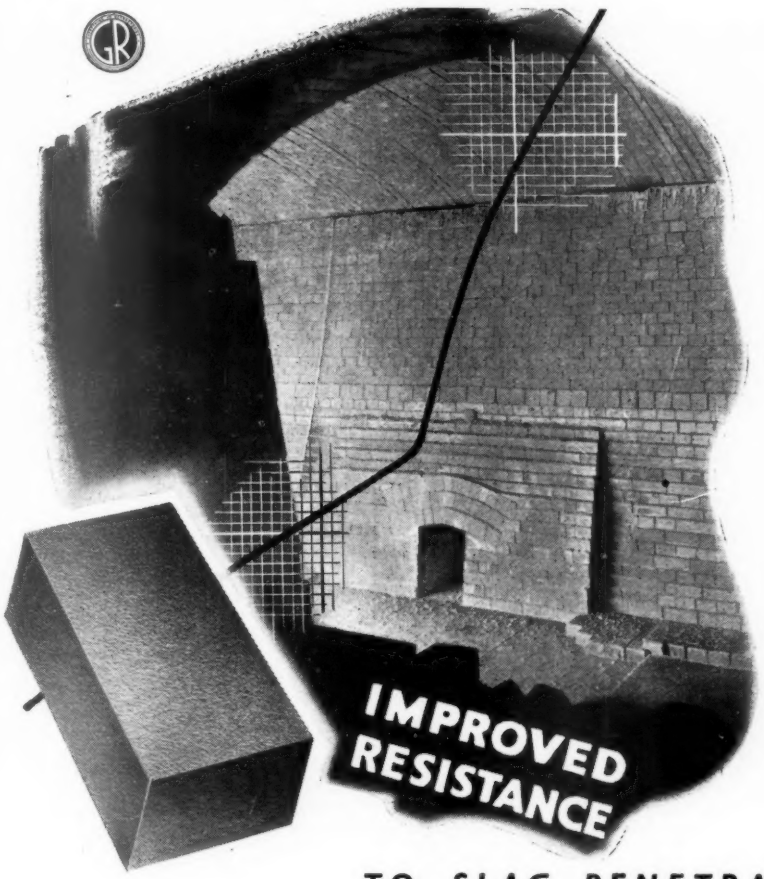
C.M.L.—To erect, instal and operate research laboratories dealing with metallurgical and chemical developments. £100. L. G. Day, L. R. Harkness, and W. E. Prytherch, Little Hockbridge, Ashley Green, near Chesham.

CONTRACTS OPEN

Any date given is the latest on which tenders will be accepted. The address is that from which forms of tender may be obtained.

Gainsborough—Supply and laying of about 23 miles of 4-in. and 3-in. dia. water mains, for the Rural District Council. Mr. John H. Haiste, consulting engineer, 4, Queen Square, Woodhouse Lane, Leeds, 2.

Nottingham, May 25—Approx. 7,000 tons of ladle-cooled slag, for the River Trent Catchment Board. Mr. W. H. Haile, engineer to the board, Derby Road, Nottingham.



TO SLAG PENETRATION

SLAG penetration of refractory materials normally accompanied by erosion, surface spalling, shrinkage, etc., is frequently responsible for the ultimate failure of refractories. To reduce the destructive effect of slag penetration, volume-stable, dense, low-porosity, low-permeability bricks, with the correct chemical composition, must be used. A characteristic of G.R. products is that they possess these necessary qualities and thus ensure minimum slag penetration. The services of G.R. engineers are available on request, to users, on the choice and application of refractories.

FIREBRICKS · BASIC BRICKS
ACID-RESISTING MATERIALS
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Raw Material Markets

IRON AND STEEL

A big expansion in the output of light castings is necessary to nourish the housing drive. Foundrymen are doing their utmost to meet the demand, but they emphasise the obvious fact that bigger outputs can only be achieved if more pig-iron is provided. Possibly the need would be less urgent if supplies of iron scrap were abundant, but this material is also scarce and present conditions do not encourage hopes of early amelioration. The most pressing need is for a further increase in the output of high-phosphorus iron, but the call for low- and medium-phosphorus grades is also increasing, as more work is accruing at the general engineering foundries, and, of course, the high output of steel involves a big consumption of basic iron.

The position in regard to supplies of steel for the re-rolling industry is under close and constant scrutiny. It is understood that the assistance of Belgian steelmakers has been enlisted to supplement the supplies of semis from home sources. Sheet bars are available in adequate tonnages, but there is a deficiency in the supply of billets, which is reflected in the eager demand for defectives.

The rollers of steel plates have entered into such heavy commitments that they are reluctant to book further orders at present and even old customers are warned that deliveries may be delayed. It seems not improbable in view of the extent of home requirements that the export trade will have to be curtailed. Demand for heavy joists and sections is also rising, while all classes of light material are specified in almost unprecedented volume. The bookings for black and galvanised sheets already in hand will call for maximum outputs until the end of the year, and it is obvious that the rail mills will also be assured of full employment for a similar period.

NON-FERROUS METALS

American advices still anticipate an early announcement from the Office of Price Administration regarding a higher price ceiling for copper. According to reports, the O.P.A. are agreeable to an increase of 2 cents on the current ceiling of 12 cents, but the industry is pressing for a 3 cents increase. Consumers in the United States are complaining that certain foreign countries, including Great Britain, are buying up stocks of copper in various foreign countries at a price equivalent to 14 cents, and that if the United States is to obtain its needed share of the metal it must promptly decide to pay an equivalent price.

Labour disputes at mines, smelters and refineries on the other side of the Atlantic continue to curtail domestic production and it has been estimated that the Metals Reserve Company may be expected to supply not less than 75,000 short tons during the current month to cover pressing needs. The position has become so urgent that action by Congress may be taken.

Stocks of tin in this country at the present time constitute about 18 months' supply on the basis of current consumption and the prospects would appear to be quite satisfactory. Meanwhile, consumption is curtailed due to restrictions on the use of the metal. The delay in reaching a decision in the negotiations between producers and the British Government for a higher price for tin is regarded as being very unsatisfactory in trade circles.

Replying to a question in the House of Commons, Mr. Wilmot, Minister of Supply, said he was satisfied that the reduced stocks of virgin zinc held at February, 1946, were sufficient for the requirements of the country and that the arrangements made for maintaining stocks were satisfactory. The Minister added that they did not maintain such heavy stocks as they maintained during the war because supplies were now open which were then closed.

OBITUARY

MR. JAMES ARCHIBALD, who was a fitter with R. & A. Main, Limited, ironfounders and gas engineers, Falkirk, for over 40 years, has died at the age of 67.

MR. SIMEON JOHN WILEY, a director and secretary of James Wiley & Sons, Limited, nut and bolt manufacturers, ironfounders, etc., and of Normalised Bolts, Limited, both of Darlaston, Staffs., has died at the age of 43.

MR. D. D. GUFFIE, a pioneer in the making of steel by the electric-furnace process, died recently. His duties took him far afield, for he was probably the first to make steel in both Greece and Burma. During the war he was engaged at the Haulbowline Works of Irish Steel, Limited.

MR. SIDNEY RICHARD PARK, who died at Southport on May 3, was chairman of William Park & Company, Forgemasters, Limited and English Tools, Limited, both of Wigan. During the 1914-18 war he was chairman of the Midland Forgemasters' Association. Mr. Park was a member of the governing body of Wigan Mining and Technical College. He was 70 years of age.

AN EXTRA-ORDINARY MEETING of Heenan & Froude, Limited, structural manufacturing engineers and ironfounders, of Worcester, will be held on Monday next to approve an increase in the capital of the company to £700,000 and to define the rights attached to an issue of 200,000 4½ per cent. cumulative redeemable preference £1 shares. The shares will be offered to existing holders in the proportion of two new preference for every 13 ordinary 5s. shares held. The purpose of the issue is partly to reimburse the company's outlay on the recent acquisition and equipment of new land and premises adjacent to the works, which absorbed £50,000, and for the purchase of 6 per cent. preference £1 shares held by outside parties in Fielding & Platt, Limited, manufacturers of hydraulic presses, etc., of Gloucester, converting this company into a wholly owned subsidiary. Treasury consent to the issue of fresh capital has been received.